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### INSPEC - 1969 to date (INZZ)

#### Accession number & update

5334435, B9609-7260-058; 960730.

#### Title

Pixel **defect** tolerant design for complete **repair** of **TFT-LCD**.

#### Author(s)

[Nakai-Y](#); [Akiyama-M](#); [Ikeda-M](#); [Suzuki-K](#).

#### Author affiliation

Toshiba Res &amp; Dev Center, Yokohama, Japan.

#### Source

Proceedings of 1994 International Workshop on Active-Matrix LCDs (AMLCD), Monterey, CA, USA, 10-13 Oct. 1994.

Sponsors: SID, Advisory Group on Electron Devices, IEEE Electron Devices Soc.

In: p.436-9, 1994.

#### Publication year

1994.

#### Language

EN.

#### Publication type

CPP Conference Paper.

#### Treatment codes

P Practical.

#### Abstract

Based on a study of the visibility of repaired pixels, we propose a new concept of pixel design rule which enables complete **repair** of the redundant pixel structure. (2 refs).

#### Descriptors

[field-effect-integrated-circuits](#); [liquid-crystal-displays](#); [semiconductor-device-reliability](#); [thin-film-transistors](#).

#### Keywords

pixel **defect** tolerant design; TFT **LCD repair**; redundant pixel structure.

#### Classification codes

B7260	(Display technology and systems).
B4150D	(Liquid crystal devices).
B0170N	(Reliability).
B2560R	(Insulated gate field effect transistors).
B2570H	(Other field effect integrated circuits).

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### INSPEC - 1969 to date (INZZ)

**Accession number & update**

5296172, B9607-7260-038; 960618.

**Title**

Pixel-defect-tolerant design based on visibility for TFT-LCDs.

**Author(s)**[Nakai-Y](#); [Akiyama-M](#); [Ikeda-M](#); [Suzuki-K](#).**Author affiliation**

Mater &amp; Device Res Labs, Toshiba Res &amp; Dev Centre, Yokohama, Japan.

**Source**

Journal-of-the-Society-for-Information-Display (USA), vol.4, no.1, p.25-31, April 1996. , Published: Soc. Inf. Display.

**CODEN**

JSIDE8.

**ISSN**

ISSN: 0734-1768, CCCC: 0734-1768/96/0401-0025 (\$1.00).

**Availability**

SICI: 0734-1768(199604)4:1L.25:PDTD; 1-5.

**Publication year**

1996.

**Language**

EN.

**Publication type**

J Journal Paper.

**Treatment codes**

P Practical; X Experimental.

**Abstract**

The **repair** of pixel defects on TFT-LCDs, which is generally carried out with laser processing or by adopting a redundant structure, is very effective for high-yield production. However, **repair** may result in abnormal pixel performance, usually due to the asymmetry of the applied pixel voltage. In this study, based on consideration of the dependence of the threshold contrast on the background luminance, the authors are able to determine the visibility of a repaired pixel. As a result, good agreement between measured and calculated visibility was obtained. Based on these results, we have proposed a new pixel design rule which enables complete **repair** of pixel defects that cannot be detected by the human eye. This design can also suppress the reduction of the aperture for **TFT-LCD** panels. Furthermore, we demonstrate a new redundant structure which reduces the change in pixel

performance after **repair** to a lower level than is attainable with any other reported technique. (5 refs).

**Descriptors**

liquid-crystal-displays; thin-film-transistors; visibility.

**Keywords**

TFT **LCD**; pixel **defect** tolerant design; pixel defects **repair**; abnormal pixel performance; threshold contrast; background luminance; repaired pixel visibility; pixel design rule; aperture reduction suppression; redundant structure; pixel voltage shift; high yield production; delta filter arrangement; Weber's law.

**Classification codes**

B7260 (Display technology and systems).  
B4150D (Liquid crystal devices).  
B2560R (Insulated gate field effect transistors).  
B2220E (Thin film circuits).

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